EPA Comments on the Revised Bremerton Gas Works RI/FS Work Plan – 8/10/16

General Response to PRP Response

Two key EPA comments on the draft Work Plan were that (1) the characterization work should start from known sources to delineate soil, groundwater and sediment contamination, and (2) all samples need to be analyzed for a full suite of chemical analyses during the initial phase of work. As currently written, the revised draft Work Plan does not present a program that carries the work from what is currently known about the Site through the initial characterization of the nature and extent of contamination at the Site. Additionally, with the introduction of the proposed COPC Screen Memo, the initial phase of sampling would not include the analyses of the full suite of potential contaminants in all locations and all media.

The investigation approaches have been restructured to fully characterize sources, then proceed outward to delineate the nature and extent of contamination in each medium. The COPC Screening Memorandum has been removed, and all COPCs are retained for analysis during the initial Site investigations in accordance with the specific comments below.

The revised Work Plan and associated SQAPP allow for much more flexibility and interim decision points when compared to the initial draft, but they lack sufficient detail to drive the investigation approach, relying on developing sampling and analytical strategies (and Work Plan addenda) as the project proceeds. The Work Plan should outline the sampling and analytical strategies and sequencing that will be used to ensure that the investigation work moves forward in a logical and organized manner, including decision criteria related to how and when to proceed to successive investigation activities. The Work Plan should contain sufficient detail and be structured to allow field staff to make the majority of necessary decisions in the field. It should also aid field staff in identifying the types of issues/problems that would warrant elevating to EPA for resolution. The plan needs to provide more guidance for these types of decisions so that the project need not stop after each work element is completed or as every problem is encountered.

Decision criteria for determining the location and extent of explorations, exploration methods, selection of samples for analysis, and when step-out explorations are appropriate, are included in the Work Plan. Conditions warranting EPA input, including unanticipated conditions and determination of monitoring well locations, have been identified. In addition, a field communication plan has been added detailing how EPA will be kept informed in real-time so that EPA review and input should not result in significant delay of the investigation.

The field crews, particularly those leading the crews, need to be intimately familiar with the contents and thought/decision processes reflected in the Work Plan. Crew leads should be involved with the development of the Work Plan itself and be involved in all project meeting related to developing the Work Plan and its implementation. If they have not been to date, they should be henceforth.

Field coordinators identified in the SAP are the same senior personnel involved in development of the Work Plan and will be responsible for leading the field crews and executing the work.

EPA's desire is to maximize field-level decision-making by Cascade's field staff and reduce the number of issues/problems that truly warrant elevation. Good communication is the key for this approach to succeed. To accomplish this, the Work Plan should be modified to identify a communication strategy that will be used to track progress in the field, identify problems/issues encountered, identify field- based decisions related to issues encountered, identify issues warranting resolution through elevation and identify the work to be performed next. The strategy can take many forms. A couple of approaches that could be used:

1. Daily emails prepared at the end of each day which discuss work accomplished, issues encountered (if any), solutions identified or needed, photos of significant findings and work to be conducted the next day; or

BREMERTON-003453

2. Create a website accessible to those needing to see it that could be updated daily with the same type of information previously mentioned.

Ultimately, the communication strategy should result in clear and open two-way communication in real time (or near-real time).

This communication strategy is described in the field communication plans (Appendices A & B) and summarized in Section 9 of the Work Plan.

Additionally, EPA is not approving the addition of a COPC Screening Technical Memorandum prior to completion of the initial phase of field work. While EPA did indicate some agreement with developing this memo conceptually when we met on May 11, 2016, this memo seems to be an unnecessary stopping point early in the investigation. There will be ample opportunity to evaluate/identify site- related COPCs once the initial phase of the investigation/sampling effort has been completed without adding a stopping point to develop (and approve) an additional planning document. The text added to the introduction of the Work Plan is sufficient for responding to EPA's comment #8. Figure 1-2 includes too much detail at this early point in the Work Plan, and should be eliminated.

The COPC Screening Memorandum has been eliminated. Figure 1-2 has been simplified to show only the general steps of the RI/FS work flow that are described in the Work Plan.

EPA does not agree with the approach to evaluate sources and shallow soil contamination and stopping at that point to evaluate the data for COPCs and plan further. EPA requires an approach that begins with source identification and continues with delineation of contamination in the various affected media from the sources identified. Specifically, it is expected that:

- The tools needed to explore the subsurface will be available from the start of the invasive work. If DPT equipment is only useful for the top 15-20 feet, there needs to be a plan for how to achieve greater depths without a significant time lapse to mobilize different equipment (or use other tools from the start).

  Alternative drilling methodologies, including hollow-stem auger and sonic, will be used if DPT equipment is incapable of achieving depths required to meet boring objectives. Field work will be scheduled and sequenced to minimize delays due to mobilization of equipment.

- Rapid turnaround laboratory analysis may be needed, depending on how the work is sequenced.

  Various approaches will be implemented to minimize delays in field activities. In some explorations, additional samples will be collected and archived for potential future analysis to reduce the potential for remobilization. When monitoring well placement requires analytical data to determine location and depth, drilling rigs for well installation will be scheduled in advance to coincide with the receipt of laboratory data. While waiting for analytical data, other field activities (e.g., explorations in other areas of the Site) will be conducted to the extent possible. Expedited turnaround of laboratory analysis will be used if needed to avoid significant field delays.

- During the field work the field team leader will need to provide daily notes and photos to EPA, either via daily emails or postings to a website (as discussed above). If a website is set up, it needs to be easily accessible. The goal is easy transfer of information for decision making by the group. The communication should including notes on what is occurring in the field and what is planned for the next few days. These notes will be included in the field report.

  Field communication plans that include daily reports and rapid data transmittal via website is included in Appendices A&B.

EPA does not agree with the degree to which the upland sampling strategy is left to field discretion. Specific guidelines on the sampling strategy need to be included in this plan. As written, the plan includes a starting point for source investigation (Figure 5-5); however, additional criteria or conditions need to be clearly documented in the WP/QAPP for:

- Deciding where to initiate and/or continue a source exploration (e.g., visible contamination, strong odor, elevated PID reading, significant geophysical anomaly);
- Identifying soil sample locations following the initial source investigation, including both horizontal and vertical step outs;
- Deciding to conclude a phase or type of sampling (e.g., no evidence of contamination based on field screening [source investigation] or concentrations below PRGs [for soil, sediment, groundwater]); and
- Deciding where to locate and how to construct groundwater monitoring wells, using the source investigation as a basis.

Specific decision criteria have been added to the SQAPPs.

EPA's input on these decision criteria are presented below.

<u>Proposed Decision Criteria for the Upland Investigation</u> *Source*

characterization:

1. In addition to the trenches as shown on Figure 5-5, please add trenches or test pits to address coal/coke storage, main plant building/furnaces, and finished gas and/or MGP by-product storage tanks. These are locations were source targets in the April 2015 draft WP/SQAPP.
   Trenches in these areas have been added or previously proposed trenches have been extended into these areas.
2. When borings are used to characterize sources beneath buildings, this plan needs to specify the criteria to be used for horizontal step-outs. EPA proposes horizontal step outs of 20 feet (consistent with the piping soil strategy).

   The Work Plan has been revised to identify 20-foot horizontal step outs for Source Investigation borings where test pits and trenches are not practicable.
3. Vertical delineation of sources via borings also needs to continue based on field screening results, not on the limitations of the drilling method. EPA supports language in Section 3.1.3.2 of the April 2015 SQAPP regarding direct-push soil borings: "If refusal is encountered within fill material (e.g., on buried debris) before the target depth is reached, the boring will be relocated one time within a five-foot radius of the original location. If refusal is met a second time, the exploration location will

BREMERTON-003455

be abandoned and alternative investigation methods will be evaluated." Language also needs to be added stating that if refusal is encountered due to dense soils, alternative drilling methods will be used to achieve depths required to delineate source contamination.

This language has been added to Section 5.5.1.2.1.

4. In addition to collection of samples to determine the composition of source materials, EPA requires characterization of samples to delineate the vertical extent of source contamination in soil. Following trenching/test pits, we propose that a minimum of 2 borings be advanced beneath identified sources, with samples collected at the following intervals: less than 2 feet beneath the source (based on field screening), then at 4 to 8 feet bgs, 8 to 12 feet bgs (may be archived), and 12 to 16 feet bgs (similar to what was proposed in the April 2015 draft SQAPP (Table A-4). The purpose would be to bound the vertical extent of contamination and also provide representative soil data at fixed intervals beneath the ground surface. Per our previous comments, each of the three samples from the borings should be tested for a full suite of analyses (VOCs, SVOCs, cyanide, metals, pesticides, and PCBs [dioxins may be requested based on PCB/PCP detections]).

   This comment needs to be resolved with EPA.

Outside source zones:

1. Areas outside the source zones should be characterized at 0 to 3 feet and 3 to 6 feet bgs using ISM. EPA's proposed decision units (discussed during the May 11, 2016 meeting) should be used as a basis for planning purposes. Areas smaller than 50 x 50 feet may be combined with other areas or sampled discretely, once sources have been delineated.

   ISM has been identified as the assumed method of investigating outside source zones, and the replacement language regarding Decision Unit identification has been added to Section 5.5.1.4.2.

2. The ISM design should assume three triplicates of 30 samples per decision unit depth horizon. Each ISM sample should be tested for a full suite of analyses (VOCs, SVOCs, cyanide, metals, pesticides, and PCBs [dioxins may be requested based on PCB/PCP detections]). Samples for VOC analysis will be collected as separate grabs. One VOC sample from each depth horizon should be collected for every 250 square feet of decision unit represented. The revised SQAPP needs to include details for the ISM design, sample collection procedures, and field/lab processing requirements.

   The above assumed ISM design has been included in the Work Plan and SQAPP. Field and lab procedures are included in Appendix A (Section 3.2.5 and Attachment B).

Deep soil/groundwater characterization:

1. EPA prefers a strategy that starts with deep soil and groundwater characterization immediately downgradient of the source zone(s). For placement/construction of wells in the interior of the ISA, EPA requires that transects with a minimum of 4 borings each be located immediately downgradient of significant sources (likely three general areas: ravine, main process area, and tar pit area). The purpose of each transect would be to ideally locate and construct one or two wells. Continuous logging and field screening, coupled with fast turnaround laboratory analysis of soil samples will be needed to decide where to locate wells for characterizing groundwater in the interior of the ISA. EPA supports collection of soil samples from each of the transect borings representing fill, vadose zone, saturated water table, deep water table/aquitard, and other (deeper water-bearing unit), using the criteria described in SQAPP Section 3.1.6.1; however, EPA requires testing for a full-suite of chemicals (VOCs, SVOCs, cyanide, metals, pesticides, and PCBs) to decide where to locate wells and which interval(s) to monitor.

   This strategy is described in Section 5.5.1.3. Specific decision logic for determining the depth and number of stratigraphic units characterized by deep borings, and the depth and location of monitoring wells, is included in Appendix A.

2. EPA supports a number of deep borings to characterize the hydrostratigraphy of the subsurface beneath the ISA. These could be initiated before evaluating groundwater within the interior of the ISA; however, the decision to complete deep borings as wells should be influenced by what is found in the source zone.

   The location and objectives of three deep borings/wells is provided in Section 5.5.1.4.1. These wells will not be sampled for COPCs unless determined appropriate later in the investigation process.

3. EPA supports a number of wells to be placed along the periphery; however, the location and screen depth should be determined after well location and construction details have been identified for the interior wells. In other words, the design of the periphery wells should be influenced by what is found in the source zone in order to more effectively monitor groundwater that is down- or cross- gradient from known zones of contamination.

The objectives for installing wells at the edges of the Site are described in Section 5.5.1.4.3. Boundary well locations and construction details will be determined after completion of the Source and Source Area Soil and Groundwater Investigations.

4. EPA supports at least four consecutive quarterly groundwater monitoring and sampling events. However, the first event should include analysis of a full suite of chemical parameters (VOCs, SVOCs, cyanide, metals, and pesticides) as well as natural attenuation parameters (dissolved organic carbon, nitrate, nitrite, sulfate, sulfide, ferrous iron, dissolved manganese, and alkalinity) and major ions (calcium, magnesium, sodium, potassium, chloride, sulfate and bicarbonate). EPA agrees that following the first event, the soil and groundwater data can be reviewed collectively to determine the scope of work for additional sampling events.

   This sampling program is described in Section 5.5.1.5. Note that bicarbonate was not added because alkalinity can be converted to bicarbonate.